
Research

A COMPARATIVE ANALYSIS OF ECONOMIC EFFICIENCY OF CONVENTIONAL AND ISLAMIC INSURANCE INDUSTRY IN PAKISTAN

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Abstract

In this study Data Envelopment Analysis (DEA) and Ratios Analysis are applied to find the economic efficiency of conventional and Islamic insurance sector in Pakistan over the period from 2006 to 2011. The average cost efficiency through DEA of Islamic insurance sector was recorded 75 percent, while the average of conventional was 67 percent. The average allocative efficiency of Islamic was 77 percent while 67 percent for conventional insurance which is the main contributor to the cost inefficiency of both type of firms. Thus, through DEA economic efficiency of Islamic insurance sector is better than its conventional counterpart. The results of efficiency through ratios analysis indicate that on average the efficiency of conventional insurance companies is better than that of Islamic insurance companies. Being new entrants in the market the profitability of Islamic insurance companies was not good, therefore the economic efficiency of conventional insurance is better than that of Islamic insurance industry over the period of analysis by ratios analysis.

Keywords: Conventional Insurance, Islamic Insurance (Takāful), Technical Efficiency, Allocative Efficiency, Cost Efficiency, Data Envelopment Analysis (DEA), Ratios Analysis

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Introduction

Efficiency and growth of financial institutions is considered as one of the main economic objectives of a country. Efficiency and growth of the financial sector leads to economic development and prosperity of the country. There exists a strong relationship between growth of economic and financial sector (Shahid et al. 2010). The role of financial sector in economic development of any country is very significant. Like other financial institutions, insurance firms are also a part of financial sector. This part plays an important role in the economic development of any country. An effective and productive insurance sector ultimately contributes to the economic growth of a country (SBP, 2005). Economic security is the most important factor after the assertion of human well-being in the present age. One of the effective instruments to achieve security is insurance. It provides indirect security to the lower strata of society and it definitely provides security to the business class for goods lost through natural, accidental or circumstantial mishap.

The efficiency of a firm means the best utilization of available resources. Efficient firms show better performance with least utilization of inputs. There are different types of efficiency concepts. Data Envelopment Analysis (DEA), being a non-parametric approach, measures economic performance in terms of technical and allocative efficiency. Technical efficiency or operating efficiency, for instance, estimates the capability of a firm to maximize its output from given inputs. Whereas, the allocative or price efficiency of a firm explains about the right mix of inputs to produce maximum outputs. The product of technical and allocative efficiency constitutes cost efficiency of a firm. Cost efficiency presents a clear picture about the best utilization of resources in order to maximize output with least cost. Resources are used as inputs and goods and services offered to customers are considered as outputs. In ratio analysis different profitability and leverage ratios are used to assess the performance of insurance firms.

Insurance companies operations are divided into life insurance business and non-life insurance business. In life insurance, companies provide risk coverage to individuals against death and

pay financial support to deceased family. The other function of life insurance companies is to provide retirement policies to individuals and groups that offer retirement benefits to policy holders. Life insurance companies, being institutional investors, collect money from policy holders and invest these small sums of money in a professional way for a longer period of time. Non-life insurance companies provide risk coverage to the individuals against property losses such as machinery, motor car and building.

Pakistan's financial sector comprises of commercial banks and other financial institutions, Islamic banks, investment banks, microfinance banks, *Mudārabah* companies, stock exchanges and insurance companies (Takāful). In Pakistan the regulatory authority of insurance industry is the Security and Exchange Commission of Pakistan (SECP), which allows the dual system, i.e. conventional and Islamic insurance system. Currently, 45 conventional insurance companies and 5 Islamic insurance companies are working in Pakistan (SECP, 2013). The progress of insurance industry in Pakistan has not been very impressive, yet the industry is not too tiny to be ignored. The assets of insurance industry for both conventional and Islamic counterparts were 386 and 501.8 billion rupee for the years 2009 and 2011, respectively (Economic Survey of Pakistan 2009-10 & 2011). Relatively, the insurance industry in Pakistan is small as compared to other emerging economies but it has huge potential for expansion.

According to the Financial Stability Review (2009), the growth rate in real premiums (inflation adjusted) in emerging economies was 3.5% whereas in Pakistan it was -3.9% and the average of the world was -1.1%. The contribution of insurance sector in GDP of Pakistan is also very low as compared to other similar countries, e.g. for the year 2008 in India it was 4.6%, Sri Lanka 1.5% and in Pakistan only 0.7% (SECP official website). According to the Financial Stability Review (2011) an international comparison shows that Pakistan is not only consistently lagging behind in terms of density and penetration of the insurance industry but its standing among the regional

countries also remained low in recent years. Irrespective of the fact the annual growth of conventional insurance sector from 2007 to 2009 was 15.22%, whereas for Islamic insurance sector it was 90.37% in the same period. In the year 2011 the growth rates of the assets of conventional and Islamic insurance companies were 11.1% and 36.44 %, respectively (SBP, 2011).

The basic objective of this study is to compare the level of efficiency in Islamic and conventional insurance industry of Pakistan through DEA and Ratios analysis. To the best of our knowledge no study has been done as yet on the comparative efficiency of conventional and Islamic insurance sector of Pakistan. Some studies assessed the efficiency of conventional insurance sector but did not focus on the efficiency of Islamic insurance sector in Pakistan (e.g. Noreen, 2009; Jam-e-Kausar & Afza, 2010 and Afza & Asghar, 2010). Evaluating the efficiency of Islamic insurance independently might not be useful for the policy makers unless a comparison is made with conventional insurance. Thus, the present study will be beneficial for conventional and as well as Islamic insurance industry. It will also be helpful for practitioners and policy makers to address the weak areas of insurance industry in Pakistan.

Literature Review

This chapter is subdivided into two segments. First part deals with the aspect of efficiency of both types of insurance companies by using Data Envelopment Analysis (DEA). Second part discusses with the efficiency of both types of insurance companies in context of Ratio Analysis.

Measurement of Efficiency through Data Envelopment Analysis (DEA)

The term economic efficiency means that resources are used in such a way to generate maximum possible output with a given input. Data Envelopment Analysis is a tool to find the economic

efficiency of an entity. It explains whether entity is using cost effective resources in a best possible mix in order to maximize output.

Measurement of efficiency of insurance sector got a significant consideration in recent years, where the empirical researches observed various matters concerning to the efficiency of insurance business. For example, Hu & Hu, (2009) analyzed the efficiency of life insurance sector in China. The findings indicated that the efficiency scores at average for all the companies were in cyclic manner. Both the scale and technical efficiency touched their heights in 1999 & 2000 and bit by bit dropped down for the rest of the years under consideration until 2004 where efficiency in average enhanced again.

Similarly, Ward et al. (2006) analyzed the efficiency level of 78 UK & German life insurance companies from 1991 to 2002. They used DEA to calculate the efficiency and concluded that German companies were better in cost and technical efficiency but not in allocative efficiency as compared to UK insurance companies.

A number of authors investigated the efficiency of banks over time [e.g. Din et al. (1996); Iimi et al. (2003); Raoof et al. (2010); Akhtar et al. (2011)]. Similarly, some studies focused on the efficiency of insurance companies in Pakistan. Noreen (2009) estimated the efficiency of insurance industry in Pakistan over the years 2000-2007. Result showed that only two firms were found to be fully cost efficient and three were technically most efficient over others out of twelve companies. Jam-e-Kausar & Afza (2010) examined the scale efficiency, technical efficiency and pure technical efficiency of 27 insurance companies of Pakistan. They concluded that non-life insurance sector of Pakistan was 82.4 % technically efficient, 89.9 % scale efficient and 91.4 % pure technical efficient. Furthermore, it was noted that in

efficiency score the insurance companies with larger size achieved superior results than the smaller and medium size insurers.

In another study Afza & Asghar (2010) analyzed the efficiency of overall insurance industry in Pakistan over the years from 2003 to 2007. It was found that on average insurance companies were 92.7 percent technical efficient, 81.12 percent allocative efficient and 75.44 percent cost efficient. The study also found that allocative and cost efficiencies were improved from 2003 to 2005 but significantly decreased in 2006 whereas technical efficiency was increased over the period of study.

Some studies have made a comparison between conventional and Islamic insurance. In a study on Malaysia, Ismail & Bacha (2011) found that there was a significant difference in efficiency of *Takāful* and conventional insurance industry and *Takāful* industry was found less efficient than the conventional insurance industry in technical efficiency. In another study on Malaysian *Takāful* industry over the period from 2007 to 2009, Saad (2012) found that in context of overall efficiency *Takāful* companies were less efficient as compared to their conventional counterparts.

Measurement of Efficiency through Ratios Analysis

Basically, ratio is a relationship between two numbers of the same kind, i.e. proportion of one number to another number. Here in this research the focus is on the financial ratios which are used as a tool to assess the performance of different sectors including financial sector, i.e. banks, insurance firms etc. Financial ratios are considered as an old, simple and practical tool for financial and planning analysis. The tool is used by accountants and financial analysts. Financial ratios are utilized by external and internal stakeholders for their financial

decisions including performance evaluation and investment analysis (Kabajeh & Dahmash, 2012).

There are many studies in which financial ratios are used to assess the performance of banking and insurance firms [e.g. Olson & Zoubi (2008); Soekarno & Azhari (2009); Webb (2010) & Akhter et al. (2011)]. Webb & Kumbirai (2010) conducted a study on South Africa's commercial banking sector over the period 2005- 2009 and concluded that in first two years the performance of banks increased but later on due to international financial crunch the performance decreased. Samad (2004) compared the performance of seven local commercial banks of Gulf region with the performance of banking industry of Bahrain during the period 1994-2001 through ratios. Results depicted that Bahrain's banks were relatively less profitable and less liquid than other banking industry in Gulf region.

Kabajeh & Dahmash (2012) conducted a study on Jordanian's insurance sector from 2002 to 2007 to find the relationship between performances ratios namely return on asset (ROA), return on equity (ROE), return on investment (ROI) and market share price. In this study ROA, ROE and ROI ratios were used as a performance indicator for insurance firms. The study concluded that there was a positive relationship between these ratios and market share price.

Soekarno & Azhari (2009) conducted a study on Indonesia over the period 2005-2009. In this study researchers used profitability and solvency ratios for assessing the performance of Indonesian's insurance sector. Study found significant differences between the performance of top seven and bottom seven joint venture general insurance companies. Top seven showed better performance than the bottom seven companies.

In another study Malik (2011) investigated return on investment, return on equity and return on assets ratios to assess the performance and efficiency of insurance firms in Pakistan over the period 2005-2009. He concluded that profitability is positively related to size and volume of capital of the firm.

Thus, performance and efficiency of conventional and Islamic insurance can also be assessed with the help of financial ratios. Ratios analysis, in addition to DEA, will reveal an alternative view of the economic efficiency of insurance sector in Pakistan.

Methodology

Data Envelopment Analysis (DEA)

In this study we followed the Data Envelopment Analysis (DEA) approach to compute efficiency scores of insurance firms. At first the idea of cost efficiency was discussed by Farell (1957), who decomposed the cost efficiency into allocative and technical efficiency. According to him, it is always an important task for a producer to expand the level of output of business with same resources. Two different approaches are used by researchers for measurement of efficiency. One is parametric approach which can be categorized into Thick Frontier Analysis (TFA), Stochastic Frontier Analysis (SFA) and Distribution Free Analysis (DFA) [Cummins et al. (1993); Hussels & Ward, (2006)]. The other one is non-parametric approach which consists of Data Envelopment Analysis (DEA) and Free Disposal Hull (FDH). DEA approach is used by many researchers [e.g. Hu & Hu (2009); Noreen, (2009); Jam-e-Kausar & Afza (2010)].

DEA is a linear programming technique for construction of efficient frontier. It places the best performing Decision Making Units (DMUs) on efficient frontier. It has a number of advantages over other techniques. It is less data demanding, it doesn't require an assumption of a functional form, it can accommodate multiple inputs and outputs easily, etc. In this study we employed DEA model of Banker, Charnes

and Cooper (BCC) with Variable Return to Scale (VRS) version, because there is variation in the size of firms. Efficiency scores under VRS make different decision making units (DMUs) of similar size. Therefore, inefficiency lies only in management, resource allocation and productivity features (Afza & Asghar, 2010).

Specification of Variables for DEA and Ratios Analysis

To define input and output variables is most critical task to evaluate the efficiency of financial sector (Sealey et al. 1977). Thus the selection of input and output variables in insurance industry is a challenging job. It becomes even more difficult in case of conventional and Islamic insurance due to certain difference in the financial statements of both types of firms. Humphrey & Berger (1992) have described three different approaches for the selection of input and output variables, i.e. intermediation approach, user cost approach and value added approach. Following Cummins et al. (1999), Afza & Asghar (2010), Cummins et al. (2010) and Eling et al. (2010) in this study we adopted value added approach to extract the output variables, because this approach considers all categories of financial publications of firms to have some output characteristics rather than differentiating inputs from outputs. Thus, input variables are business services, debt, equity and labor which are used by many previous researchers [e.g. Cummins et al. (1999); Tone et al. (2005); Noreen (2009); Hu & Hu (2009); Afza & Asghar (2010); Jam-e-Kausa & Afza (2010) & Eling et al. (2010)]. Moreover, following Kazemipour (2011), we also used number of branches as input variable.

Different output variables have been used in different studies for the calculation of efficiency of insurance industry. In our study net premium, investment income and net claims are used as output variables. These variables have been used as output in many previous researches [e.g. Noreen (2009); Afza & Asghar (2010); Jam-e-Kausa & Afza (2010); Ismail et al. (2011); Ismail et al. (2011) & Gattoufil et al. (2012)]. Premium is adopted as output variable, because

it represents the risk pooling and risk bearing function of insurance companies. Investment income has been taken as an output variable due to the fact that a significant portion of net profit is generated from investment revenues (Worthington et al. 2002). Net claim (amount of payments) is used as an output variable by Eling et al. (2010) and Kazemipour (2011). Hence, input-output variables selected in this study are given below:

Table 1:

Input and Output Variables for DEA

Variables	Input/Output	Measure
Business services	Input	Commission paid and all operating expenses excluding depreciation and labor cost
Debt	Input	Total debt
Equity	Input	Total equity
Labor	Input	Number of employees on yearly basis
Number of branches	Input	Number of branches on yearly basis
Net premium	Output	Net premium revenues (Gross premiums – Reinsurance expenses)
Investment income	Output	Investment income
Net claims	Output	Net claims

For checking cost efficiency DEA requires input prices. Therefore, we calculated the price of business services as a ratio of expenses on business services to total assets. Debt consists of total debt. Ten years government bond rate in Pakistan is used as a proxy for price of debt. Price of equity capital is considered as a ratio of equity capital to total assets. Labor means number of employees working in a firm. Price of labor is determined as the total salaries, wages and benefits to employees divided by number of employees. Number of branches means how many branches the specific firm keeps on yearly basis. Price of branches is the ratio of fixed assets to number of branches. Data on fixed assets is extracted from the balance sheet of firms.

Ratios Analysis Variables

In this research we also selected 12 variables as financial ratios. These variables refer to appropriate financial ratios for general and life insurance in context of conventional and Islamic Insurance companies in Pakistan. The ratios are divided into two categories, namely profitability or efficiency ratios and solvency or liquidity ratios. The determination of these ratios are also adapted according to the needs of the industry and in correlation with the culture and business process of insurance industry. The variables of both categories are explained below:

Profitability/Efficiency Ratios

a) Return on Assets (ROA) = Net Profit (Loss) / Total Assets * 100

ROA expresses the capacity of earning profit by a firm on its total assets employed in the business. It is calculated as percentage of net profit after tax to total assets. It is a good measure of checking how efficiently firm is utilizing its assets to earn profit.

b) Return on Equity (ROE) = Net Profit (Loss) / Total Equity * 100

ROE reflects return on shareholders' equity. It is a direct measure of returns to the shareholders. It is calculated as a percentage of the net profit after tax to total shareholders' equity. It is also useful for insurance sector.

c) Return on Investment (ROI) = Net Investment Income / Investments * 100

ROI is the ratio between net investment income to investments. It is a good measure to check the efficiency of a firm in terms of investment.

d) Earning Per Share (EPS) = Net Profit (Loss) / Number of Ordinary Shares

EPS is the ratio between net profit after tax to number of shares outstanding at the end of the year as shown in balance sheet and its relevant notes to accounts. This ratio is also useful for

insurance sector to know how much company earns on per share basis.

e) Net Claims Expense / Net Premium * 100 (NC/NP)

NC/NP ratio expresses the efficiency of insurance company and is calculated as the net claim expenses on net premium. Higher ratio indicates that the claims are more than premiums. It is a useful measure for insurance companies.

f) Underwriting Profit to Profit After Taxes * 100 (UP/PAT)

UP/PAT ratio shows underwriting profit as percentage of net profit. Underwriting profit is net of underwriting income and expenses of the cost of obtaining new policies. This ratio is also useful in terms of measuring efficiency for insurance companies in reducing expenses.

g) Claims Incurred to Net Premium * 100 (CIN/NP)

CIN/NP ratio describes the proportion of claims incurred to net premium. Claims incurred include total underwriting provision, amount due to other insurers, advance premium and accrued expenses. It is also useful for insurance companies.

h) Net Investment Income Ratio = Investment Income to Net Premium * 100 (IIC/NP)

IIC/NP ratio demonstrates the relationship between investment income and net premium. This ratio is used to measure efficiency of an insurance company.

i) Shares Internal Value (SIV) = Total Equity Capital / Number of Ordinary Shares

SIV ratio explains the relationship between equity capital and number of ordinary shares and calculates the internal value of share.

Solvency/Liquidity Ratios

a) Debt Ratio = Total Liabilities / Total Assets

The ratio of liabilities to assets shows the proportion of firm assets, which are financed through debt.

b) Debt to Equity Ratio (D/E)= Total Liabilities / Total Equity

D/E ratio shows the proportion of firm's liabilities to equity capital.

c) Investment to Total Assets (I/TA)= Investments / Total Assets * 100

The ratio between investment and total assets reflects investment activity with reference to total assets of a firm. It indicates the portion of total assets used for investment in various investment avenues. This ratio is also very useful for insurance companies.

The selection of above mentioned ratios is based on literature review in order to assess the financial performance of an insurance industry [e.g. Soekarno & Azhari (2009); SBP (2011); IAP (2011); Malik (2011) & Kabajeh & Dahmash (2012)].

Data

According to SECP (2013), 49 life and non-life insurance companies are working in Pakistan. Out of 49 companies 5 are Islamic insurance companies. Focus of this study is on comparison between conventional and Islamic insurance sector of Pakistan. Thus, we selected 5 conventional and 5 Islamic insurance companies as a sample for this study. In selection of conventional insurance companies we kept in mind the element of representation from both life and non-life and also asset size of the company. We considered those companies whose asset size was similar to the asset size of Islamic insurance companies. Data for DEA analysis and ratio analysis was obtained from the annual audited financial reports of respective companies

over the period from 2006 to 2011. Two life- and 3 non-life insurance companies were selected for analysis from each sector.

Results and Discussion

This section is subdivided into two parts. First part deals with the results of efficiency through DEA. Second part contains the results of ratio analysis.

Results of Data Envelopment Analysis

Overall Efficiency of Insurance Sector

The average results obtained from this analysis are shown in Table 2. Results depict that technical efficiency of the industry over the period of consideration remain fully intact, although there was little variation shown in this period. However, on average insurance sector has shown lower allocative efficiency except during 2008, where it showed 86 percent allocative efficient. Average allocative efficiency decreased from 79 percent in 2006 to 64 percent in 2011. Allocative efficiency dominated the cost efficiency in this period. Cost efficiency has also shown a decreasing trend over the period of analysis. In 2006 industry was 79 percent cost efficient and in 2011 its efficiency decreased to 63 percent.

Table 2: *Overall Insurance Industry Year-wise Performance (DEA)*

Year	Technical Efficiency	Allocative Efficiency	Cost Efficiency
2006	1.000	0.789	0.789
2007	0.968	0.678	0.649
2008	0.982	0.857	0.841
2009	0.994	0.740	0.736
2010	0.979	0.741	0.728
2011	0.981	0.639	0.625
Average	0.984	0.741	0.728

Note: Making data acceptable for DEA, uniform +ve values were added in Net income &

Net Premium column

Results also indicate that on average the insurance sector remain 98 percent technical efficient during the period of analysis. On the other hand cost efficiency of this sector is recorded at 73 percent, which shows that insurance firms could reduce 27 percent of expenditure from the existing level at same level of output.

Comparative Efficiency of Islamic and Conventional Insurance

One of the basic objectives of this research is to compare Islamic and conventional insurance sector of Pakistan in context of efficiency. The results obtained from DEA in Table 3 depict that on average cost efficiency of Islamic insurance sector is higher than conventional insurance sector. Looking at firm-wise results, Islamic insurance companies are more efficient than conventional insurance companies except EFU. Over the period of analysis the cost efficiency of Islamic insurance sector is 75 percent while the conventional insurance is 67 percent cost efficient. Thus, Islamic insurance sector is more cost efficient than conventional insurance sector. One thing important to note is that allocative inefficiency is the main contributor toward the cost inefficiency of both types of firms.

Table 3:

Efficiency of Conventional and Islamic Insurance Companies (DEA)

Firms (C=Conventional, I=Islamic)	Technical Efficiency	Allocative Efficiency	Cost Efficiency
EFU-General Insurance (C)	1.000	1.000	1.000
EFU-Life Insurance (C)	1.000	1.000	1.000
Pak Qatar General Takaful (I)	1.000	0.988	0.988
Pak Kuwait General Takaful (I)	1.000	0.869	0.869
Dawood Family Life Takaful (I)	0.965	0.863	0.835
Pak-Qatar Life Takaful (I)	0.847	0.680	0.557
Askari General Insurance (C)	1.000	0.551	0.551
Saudi-Pak Insurance (C)	1.000	0.488	0.488
Takaful Pakistan (I)	0.995	0.487	0.485
Jubilee Life Insurance (C)	1.000	0.316	0.316
Overall Average	0.981	0.724	0.709
Islamic Insurance Mean	0.961	0.777	0.747
Conventional Insurance Mean	1.000	0.671	0.671

In terms of technical efficiency conventional insurance sector is little bit more efficient than Islamic insurance sector but this difference is not much significant. It means that the insurers are more efficient in terms of technical efficiency. In other words at operational level firms are producing approximately at optimum level. The failure is at allocative efficiency level. Allocative efficiency of Islamic insurance sector is 77 percent, while conventional sector is 67 percent allocatively efficient. Although both types of firms are not equating their marginal products to input prices, but Islamic insurance sector is more efficient than conventional insurance sector on allocative efficiency. Thus, it can be concluded that by using DEA on VRS on average Islamic insurance sector is more cost efficient than conventional insurance sector in Pakistan over the period of analysis. One reason for more efficiency of Islamic insurance sector might be *Shari'ah* compatibility of firms. Other reason might be that this sector is new in Pakistan and it is striving hard to remain intact and make

Table 4:

Performance of Conventional and Islamic Insurance Companies (Ratios)

Note: All ratios are in percentage except EPS, SIV in rupee and Debt, D/E in times

Source: Annual audited financial statements and financial statement analysis of State Bank of Pakistan

Firm	ROE	ROA	ROI	EPS	CORNER	UP/PAT	CCORNER	NCORNER	SIV	UFA	Debt Ratio	D/E
Pak. General	9.34	3.07	62.34	0.48	108.03	1072.76	1.81	117.92	10.04	8.63	0.47	0.60
Pak. Q. General	-2.01	-1.58	13.01	-0.17	200.62	23128.1	-152.37	158.94	9.27	41.12	0.35	0.46
Islamiat Pak	16.31	-5.9	18.78	-0.98	236.31	3.86	2.04	71.81	5.91	11.57	0.63	2.09
Pak. Q. Life	12.17	6.91	4.28	-0.86	21.97	-05.38	187.41	8.87	7.33	42.34	0.43	1.39
Desmond Life	6.16	4.54	9.36	0.57	46.32	0	25.59	4.09	8.82	51.2	0.15	0.21
Avicor General	10.8	2.81	5.79	1.73	128.02	266.92	4.83	61.02	11.9	38.1	0.75	3.03
Sun Life	-11.15	-4	9.03	-0.71	242.04	-152.95	6.63	61.62	6.48	16.67	0.59	0.39
EEF General	14.48	6.41	9.28	20.1	184.68	24.25	29.64	71.33	88.85	53.64	0.58	1.8
ERU Life	31.52	2.64	6.14	7.53	13.98	522.82	17.81	21.84	18.99	86.27	0.18	0.92
Islamiat Life	16.46	1.41	7.37	2.14	13.28	934.09	4.68	33.9	11.64	64.56	0.92	11.19
Conv. Mean	12.42	1.85	7.52	6.16	116.46	319.05	12.72	49.94	28.57	51.85	0.6	3.51
Islamic Mean	-5.46	-3.18	21.99	-0.42	122.65	-5238.68	12.89	72.29	8.27	30.97	0.4	0.96
Overall Mean	3.48	-0.66	14.76	2.87	119.55	-3469.82	12.81	61.11	18.32	41.41	0.5	2.24

Source: Annual audited financial statements and financial statement analysis of State Bank of Pakistan

progress in Pakistani market. However, both types of firms need to improve their allocative and cost efficiencies.

Results of Ratios Analysis

Efficiency of Islamic and Conventional Insurance Industry

In this section company wise and industry wise comparison is made between Islamic and conventional insurance companies over the period 2006-2011. The results are produced in the following table:

Results depicts that EFU is showing better results on ROE, ROA, ROI, EPS and SIV ratios as compared to all other companies. Pak-Kuwait *Takāful* is showing better results among Islamic insurance companies in same ratios. It might be due to the age and maturity of this Islamic insurance company in Pakistan.

According to the results the efficiency of conventional insurance companies on ROE, ROA, EPS and SIV ratios is better than Islamic insurance companies except on ROI. These ratios mostly depend on net profits of the firms. Net profits of conventional insurance firms were higher than Islamic insurance firms. This might be due to age factor and more investment avenues of the conventional insurance companies.

While comparing claim incurred to net premium (CIN/NP) ratios of conventional and Islamic insurance industries, it can be noticed that the result of former is better than the result of later. The CIN/NP ratio of conventional insurance industry in average is lower than the ratio of Islamic insurance industry. It shows that conventional insurance companies are more efficient to manage their claims, investments and profits.

Results of underwriting profits to profit after taxes (UP/PAT) indicate that the performance of conventional insurance industry

was better than Islamic insurance industry over the period of observation. The average ratio of UP/PAT of Islamic insurance industry is negative while conventional insurance industry results are in positive figure.

Investment to total assets (I/TA) ratio of conventional insurance was higher than that of Islamic insurance. Thus, on this ratio conventional insurance industry also showed better performance as compared to Islamic insurance industry.

Results on investment income to net premium (IIC/NP) indicate no significant difference between conventional and Islamic insurance firms. Conventional insurance firms also showed better performance on NC/NP ratio. The average of this ratio is lower for conventional insurance firms and higher for Islamic insurance firms. As discussed earlier, higher is the ratio, lower is the performance of the firm.

Debt and debt to equity ratios of Islamic insurance industry are better than conventional insurance industry because these ratios are lower for Islamic insurance industry as compared to conventional insurance industry. Islamic law does not permit the interest based debt. This might be one of the reasons that debt ratios of Islamic insurance companies are lower than the ratios of conventional insurance companies.

Thus, through ratios analysis it can be concluded that on average the efficiency of conventional insurance industry is better than that of Islamic insurance industry in Pakistan. It might be so because the Islamic insurance companies have not been showing better results in terms of profitability over the period of analysis as compared to the conventional insurance companies and in our analysis most of the ratios relate to profitability of the insurance industry. This could be due to the expansion in the network and high amount of

expenses which results in low profitability of Islamic insurance industry.

Conclusions

Results on efficiency through DEA indicate that on average both types of firms remain technically efficient. Results also indicate that cost inefficiency of Islamic insurance companies is lower than the conventional insurance companies. Main reason of cost inefficiency in both types of firms is allocative inefficiency (price inefficiency). It means both type of firms are not successful in equating their marginal product to input price. Results also indicate that cost and allocative efficiencies are showing decreasing trends over the period of analysis. This would be due to increase in the prices of inputs and the expansion in the branch network and workforce over the period.

Results of efficiency through ratio analysis indicate that on average the efficiency of conventional insurance companies is better than that of Islamic insurance companies on ROE, ROA, EPS, CIN/NP, UP/PAT, I/TA, NC/NP and SIV ratios and approximately equal on IIC/NP. However, on ROI, Debt and D/E ratios, Islamic insurance companies showed better performance than their conventional counterparts. Overall results of conventional insurance industry on ratios analysis are better than the results of Islamic insurance industry. Therefore Islamic insurance industry should focus on above mentioned ratios in order to increase its efficiency to compete with its counterpart. It might be due to low profitability of Islamic insurance firms as compared to the conventional insurance companies.

Difference in the results of efficiencies through data envelopment analysis and ratios analysis might be due to different types of variables taken for both types of analyses. The other reasons

might be the factor of profitability. In ratio analysis the focus was on profitability ratios. Profitability figures of Islamic insurance companies are not good as compared to conventional insurance companies. Thus, results for conventional insurance industry are better than the results of Islamic insurance industry on ratio analysis.

In conclusion, both of conventional and Islamic insurance industries need to improve their cost efficiency. Both types of firms are required to make maximum use of inputs and make them more cost effective. Both types of firms are required to decrease their cost by rationalizing their expenditure on branch network and work force in order to maximize their economic efficiency. The Islamic insurance industry, being new entrant in market, needs to strive hard. Islamic insurance industry has to improve its ability to earn profit through cost effectiveness. Although this industry showed comparatively better results on cost efficiency but it still needs efforts to be fully cost efficient. Thus, Islamic insurance industry has to improve its efficiency for its own development and for its contribution towards the development of Pakistan.

Due to data limitation for present study future research may be extended to more companies and additional variables for assessing the efficiency of insurance sector of Pakistan.

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